

NERA

Economic Consulting

NERA Review of RAM Model - Status Report and Summary of Anticipated Conclusions

November 2003

Draft - Preliminary



How Markets Work



The RAM Group Specified Objectives Of The Market Model At The Outset

1. ***Assure adequacy.*** The model to acquire resources should assure adequacy and should be capable of being applied consistently in each region through a single commodity (unforced capacity)
2. ***Choose appropriate planning horizon and commitment period.*** Address lead times needed to develop and construct new generation and develop and implement demand response programs
3. ***Provide appropriate price signal.*** Create a market process that will reveal the appropriate price signal for market adequacy, and minimize market power and market gaming opportunities
4. ***Encourage entry.*** Accommodate market entry for all market participant types and retail load switching for LSEs
5. ***Integrate with other markets.*** Support the development of a competitive wholesale marketplace for energy and ancillary services



NERA Began With Elements of Proposal Established by RAM Group

- The commitment of resources to meet the unforced capacity obligation is through a *centralized auction*
- *Resource providers* include existing generation, planned generation, bilateral contracts for capacity resources, load management products, and transmission upgrades
- Participation in the centralized auction is *voluntary*
- *Bilateral transactions* are an integral part of the market.
- Each ISO conducts its own separate centralized auction; however, the timing of the auctions will be *coordinated*.
- ISOs with *locational requirements* may conduct separate auctions for each location



The RAM Group Specified the Scope of NERA's Recommendations

1. ***Planning horizon*** - the length of time between the auction and the time at which the winners must start providing resources committed through the auction.
2. ***Commitment period*** - the length of time for which the winners at the auction commit resources
3. ***Auction format*** - the way bidding is organized and competition among resource providers is fostered
4. ***Percent procured*** - whether the full requirement is procured through one or several auction
5. ***Monitoring and Mitigation*** - market design features that aim to prevent the exercise of market power or gaming and analysis of market information to assess performance in relation to a competitive benchmark
6. ***Variable resource requirement*** - whether the demand curve should be added to the model

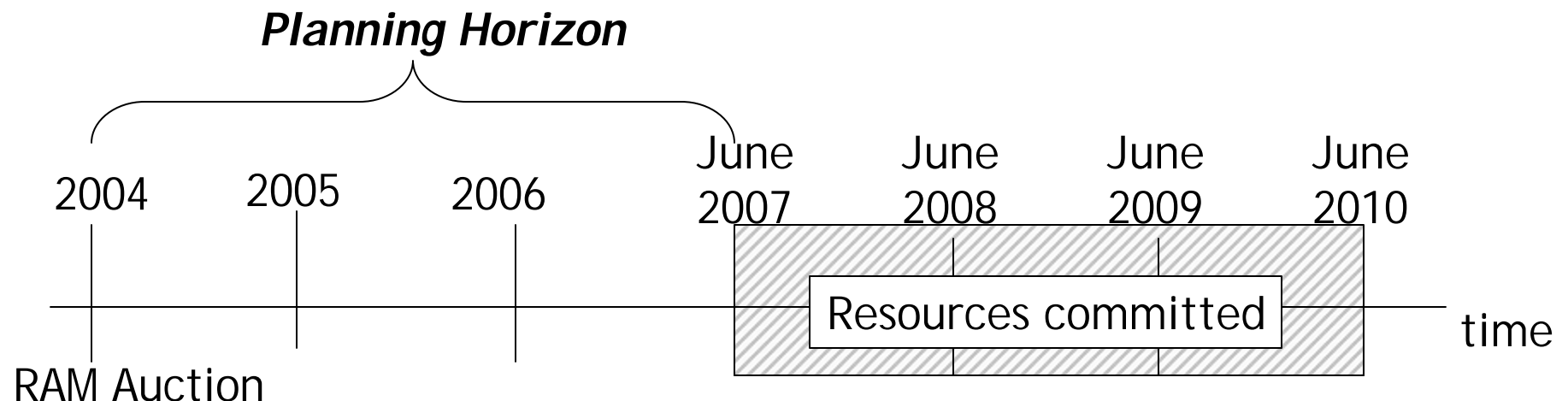


Summary Recommendations

Planning Horizon	——	3 Years
Commitment Period	——	3 Years
Percent Procured	——	3-year rolling
Auction Format	——	Clock Auction
VRR	——	Possible but not necessary
Monitoring	——	Bundle of measures to protect competition

Our Conclusion Regarding Planning Horizon Has Proven To Be A Driver Of Other Conclusions

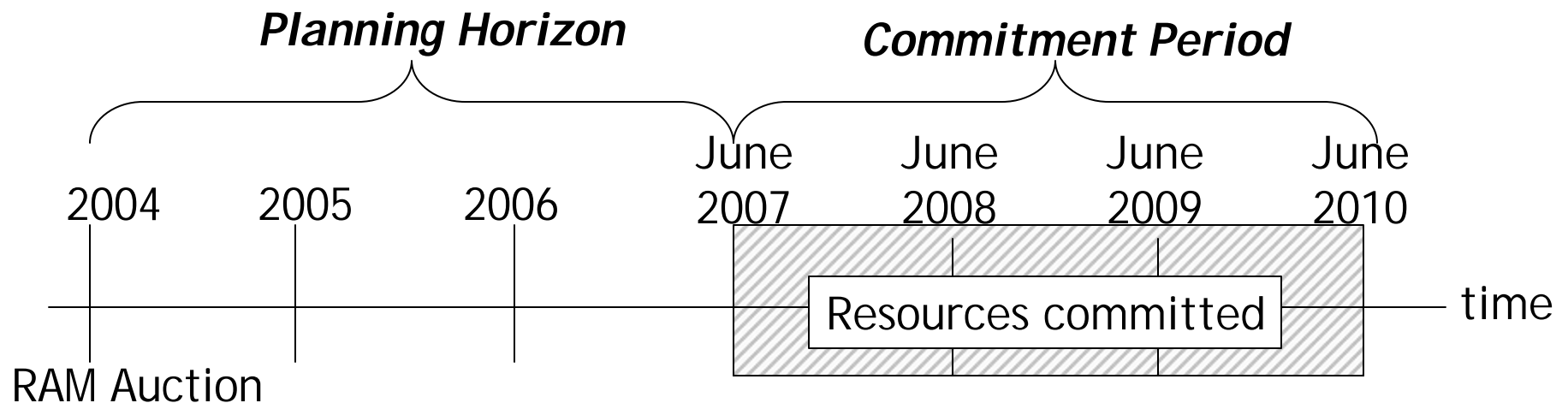
NERA Recommends a 3-Year Planning Horizon



- The importance of the planning horizon is in accommodating lead times and harnessing the competitive potential of planned resources
- Must work hand in hand with carefully set qualification criteria

Our Conclusion on Commitment Period Works Hand-in-Hand with Recommendation on Percent Procured

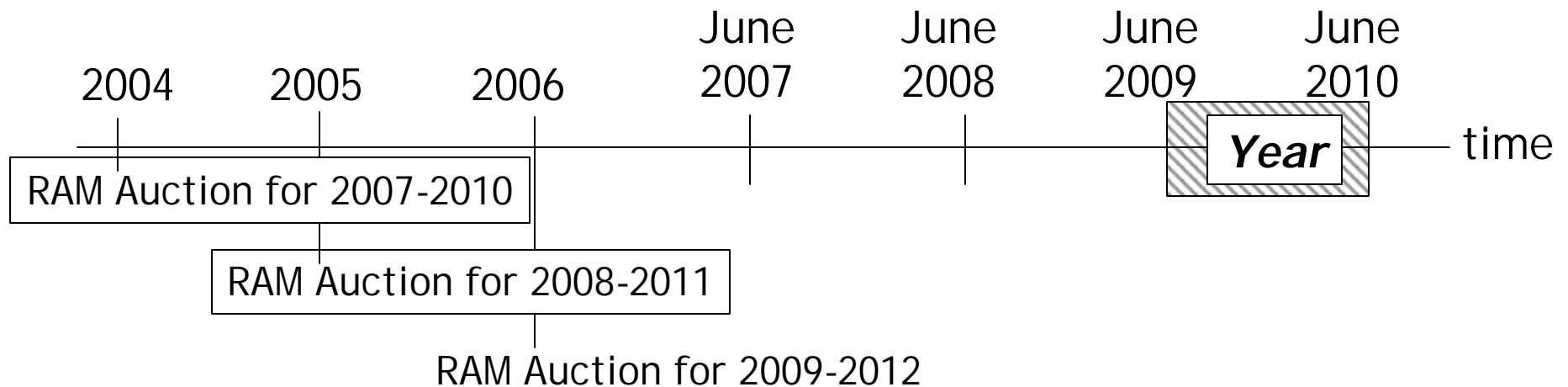
NERA recommends a 3-year commitment period



- The importance of the length of the commitment period is
 - ▣ in providing revenue certainty for a longer period so as to induce providers to bid at lower prices
 - ▣ in providing options for staggering procurement and avoiding impact of transient events

A Rolling Option is a Way to Procure Through Several Options the Requirement for One Year

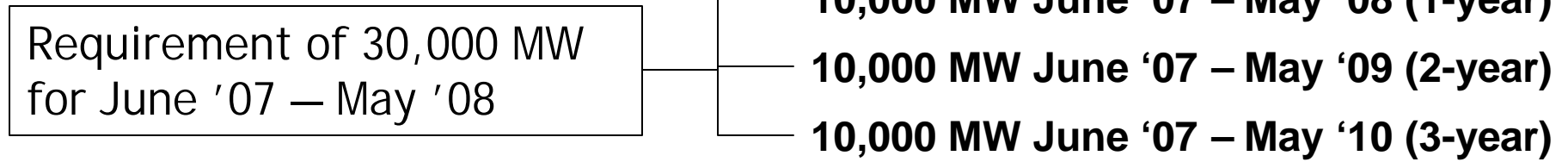
NERA recommends a 3-year rolling option with a fixed commitment period



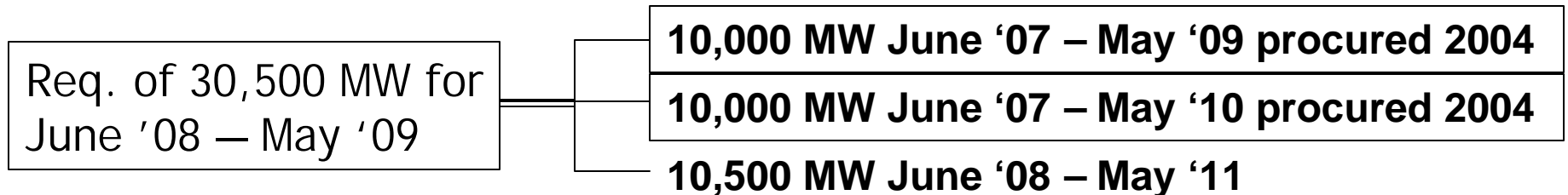
- Although other commitment periods could meet objectives (e.g., 1 or 2 years), no other would likely do at lower prices or with more protection from transient market events

Example of Rolling Option with a Fixed 3-Year Commitment

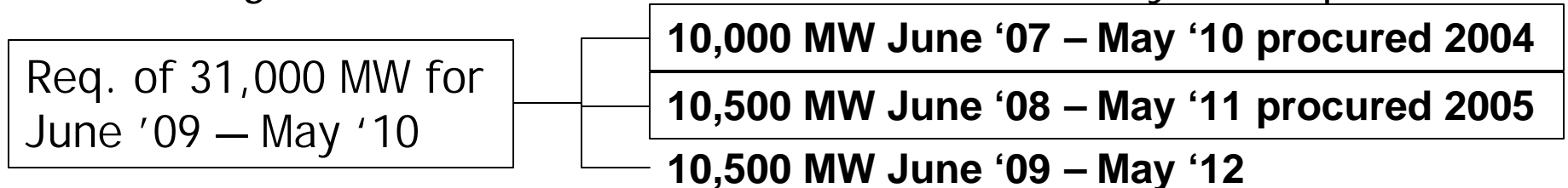
- *2004 transition auction* for June '07–May '08 requirement



- *2005 regular auction* for balance of June '08–May '09 requirement



- *2006 regular auction* for balance of June '09–May '10 requirement



Descending Clock Means Minimal Risk for Providers

- Multi-product design possible
 - ▣ MWs for all products are procured at once
 - ▣ Initial auctions may be for one ISO only
- Bidding proceeds in rounds
 - ▣ Suppliers state how many MW they want to supply at prices suggested by the Auction Manager
 - ▣ Prices tick down if there is excess supply
 - ▣ Suppliers could switch their bids from one product to another in a given auction if it is for multiple products

Pre-Auction Timeline Assuming Qualification is Sufficient for Requirement

Resource Providers



Prices Tick Down When There Is Over Supply

Round 1

EDC	Price	#bid	# to buy	over supply	Oversup. Ratio
Maine	\$80/kW-yr	40,000	32,000	8,000	0.25
Boston	\$125/kW-yr	11,000	10,000	1,000	0.10
CT	\$80/kW-yr	85,000	70,000	5,000	0.21
RONE	\$70/kW-yr	25,000	25,000	0	0.00

Round 2

EDC	Price (\$/WM-day)	#bid	# to buy	over supply	Oversup. Ratio
Maine	\$76.00	39,000	32,000	8,000	0.219
Boston	\$123.00	11,000	10,000	1,000	0.100
CT	\$77.00	86,000	70,000	5,000	0.229
RONE	\$70.00	25,000	25,000	0	0.000

VRR Analysis Has Focused on Its Compatibility with the Clock Format and Its Ability to Achieve the Objectives

The **VRR** is the ***variable resource requirement*** or ***demand curve approach***. The single requirement on a MW basis is replaced by a downward sloping curve that relates each level of capacity procured to a price that the ISO is willing to pay for that level of capacity

NERA's analysis indicates that the VRR is not required to achieve the objectives. The NERA proposal excludes the VRR. The NERA proposal is nevertheless expected to achieve market outcomes similar to those under the VRR and main elements can work in conjunction with VRR. The VRR would be desirable if there were a shorter planning horizon than years.

First Line of Defense for Mitigation is Encouraging Participation

- Promotion
 - ▣ Clear communication of rewards and obligations associated with commitment
 - ▣ Announce range of starting prices for auction
 - ▣ Training and information
- Transparency
 - ▣ Clear qualification criteria and bidding rules
 - ▣ Ability of bidders to understand how price is determined
 - ▣ Mitigation measures that provide clear bounds
- Confidence in Market
 - ▣ Stability of design

Second Line of Defense is Careful Qualification Requirements

- Bidders would, as a condition of qualification, represent that they will be acting independently and competing against their rivals. They would undertake:
 - ▣ To bid independently (consortia could be allowed if facilitate participation of smaller providers, e.g., demand response providers)
 - ▣ Not to communicate information that could allow rivals to infer their bidding strategy
 - ▣ Not to use same advisors or any other third parties that could serve as intermediaries to facilitate a coordinated outcome

Third Line of Defense is to Set the Starting Price Appropriately on Basis of Qualification Results

Range of starting prices announced before qualification

Qualification insufficient

Administrative price set

Auction not run

In general, no further mitigation or monitoring

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Qualification weak

Reserve Price Set or Restrictions on Bids

Result acceptable (*res. price set in ref. to benchmark*)

Monitoring of bidding behavior

Qualification strong

Starting Price Set

Result to be compared to benchmark

Monitoring of bidding behavior

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Fourth Line of Defense are Additional Rules at the Auction

NERA recommends that

- *Only aggregate information be provided*
- *Information be limited further as auction progresses or when excess supply in auction is low*

The *information* in a clock auction include the quantities offered at prices suggested by the auction manager and the prices in each round.

Restrictions on bids may be required for market with consistent market power problems.

Last Line of Defense is Monitoring After the Auction

Monitoring can concentrate on bidding behavior or can include the comparison of the auction result to a competitive benchmark.

- Monitoring can check for possibility of coordinated behavior, possibility of incumbent attempting to extend power over market or other possible exercise of market power
- Evaluation of auction result can use one of several competitive benchmarks
 - Entry standard, long run competition, going-forward

There Are Inherent Interrelationships Between The Reserve Price, The Benchmark And Auction Results

Quality of result will depend very heavily on the degree of credibility in the future of the RAM and stability of accepted results

Reserve price / benchmark sets expectations as to risk of future RAM result

Market provides ultimate test of benchmark

Expectations of future RAM revenue factor into benchmark range